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ABSTRACT

Visscher's functional analysis of the impact of information technology (IT) is the theoretical basis for this assessment of the impact of the microcomputer on secondary school administration. Data were collected through indepth interviews with a non-random sample of 13 Quebec secondary school principals and vice-principals, and 3 senior administrators. As a cultural extension or type of tool used by people, IT: (1) offers flexible, personalized students' programs of study; (2) improves public relations; and (3) limits the promotion opportunities of technologically knowledgeable principals. The impact of IT on secondary schools is limited by the definition of the principal's role as a "person-oriented" position. Most principals are more concerned with maintaining the status quo; persons who are technically inclined are not rewarded or promoted. The study of technological change in education must therefore consider the social forces at work that limit the development of IT in schools. (10 references) (LMI)

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THE IMPACT OF INFORMATION TECHNOLOGY ON SECONDARY SCHOOLS: An Exploratory Study

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ABSTRACT

Information technology is a cultural extension (a type of tool) of people. Three major extensions were identified in a non-random survey of Quebec secondary school principals, principals who were active users of information technology. Information technology has enabled students to have better, personalized programs of study, it has limited the promotion opportunities of "techie" principals, and it has improved public relations efforts of schools thereby enhancing their enrollments. (Keywords: Impact of technology; technology and change; social impact)

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INTRODUCTION

The aim of this study was to explore the impact of current information technology (IT) on the administration of secondary schools. Since the early 1960's, when mainframe computers and low level programming languages were brought to bear upon school administration, there has been a steadfast increase in the use of these tools in educational administration. Until recently, a discussion of the impact of IT on educational administration has had a decidedly "technical" slant. That is, the "impact issue" has been addressed by focusing on the ways IT has replaced hand or mechanical operations, how IT has made administration more efficient. However, this literature has tended to ignore or mask the more profound impact of technology on educational administration. Few educators have investigated the effects of IT on the social organization of the school.

Recently, Visscher (1988) proposed a model that addressed the impact of IT on educational administration, a model that went beyond the technical level. IT combined with the change process in education to have an impact upon productivity, labor quality and organization structure. By productivity Visscher meant effectiveness - attaining goals, and efficiency - the use of minimum resources for a specific job. Labor quality was concerned with "labor content (the

nature: e.g. varied, routine, autonomous work), conditions (e.g. labor time, salary), circumstances (the ergonomic and organizational characteristics of the operating environment) and relations (among the employees)." Organizational structure referred to the composition of the organization and the control of performance (1988, p. 30). Through interviews in seven schools Visscher (1988, pp. 32-33) found:

1. The computer was used primarily by clerical staff, not by teachers or administrators.
2. The computer was not used to carry out new activities made possible by the new technology. Instead, people received the information they formerly received, but it was produced by the new technology.
3. Procedures relating to the supply of data and the division of labor were modified to produce better efficiency.
4. There was a frustrating transition period in bringing in the new technology.
5. Neither teachers nor administrators experienced changes in labor quality.
6. At the board level, some districts created a new centralized division to handle computer applications.
7. Principals did not use the computer to increase control of staff; yet, in centralized districts more control of clerical staff was evident.

In sum, Visscher found little impact of IT on school administration beyond the automation of former applications.

The purpose of the present exploratory study was to build on the work of Visscher and go beyond how one works in a technical sense. The purpose was to explore the broader impact of IT on the administration of secondary schools. The study was set in the modern highly centralized state-run

public school system of Quebec, Canada in 1990. The findings reported seem clearly related to the education setting, to issues confronting educational administrators, and to the normative structure of the Quebec school system. The findings may be generalized elsewhere to the extent that the context and setting are similar to the current conditions in Quebec.

METHOD

The investigation included a sample of 13 secondary school principals and vice-principals, and 3 senior administrators, 2 of whom had been secondary principals. My intention was to interview principals experienced in IT and senior administrators who had championed IT. I first interviewed a principal who was reputed to have developed IT extensively in his former school; staff members referred to him as Mr. Chips. He suggested I interview his replacement at his former school to see how the innovations he had created were being handled under the new man. Subsequent interviews involved other principals and a few successors, as I chained together a sample of respondents knowledgeable about information technology. The sample was not randomly drawn. The sample was clearly biased toward administrators who used IT extensively. In fact, the

likelihood was that these "technological - techie" administrators were in the minority in Quebec.

Interviews took place in the principal's office or over the telephone. They lasted between 30 to 50 minutes. A single research question was addressed:

> "What has been the impact of computers or microcomputers on school administration in your experience?"

Respondents' comments were probed extensively; examples or stories were sought to back-up volunteered comments. This indirect interview technique yielded 29 pages of field notes.

I was looking for a diverse set of "impacts." Therefore, in analyzing data, each interview was reviewed to see if something new could be added to what prior interviews yielded.

DISCUSSION AND FINDINGS

> The bowerbird occupies the jungles and thickets of New Guinea and northern Australia and, as its name implies, builds a bower, with which to attract and woo its mate. The elaborate bower, constructed of twigs and grass, is decorated with shells, iridescent skeletons of insects, seeds, clay balls ... these objects have in effect become externalized bundles of secondary sexual characteristics ... connected to the male (Hall, 1976, p. 25).

Like the bowerbird, people have externalized many of their characteristics. People use all sorts of tools, including language, to develop a better way of life, to increase their power, to improve their efficiency.

Information technology has become just such an extension for some school principals. It has become a means to improve school administration in the service of students and teachers. However, it is clear that for some principals IT remains a foreboding tool beyond their grasp; for others, it is a mere gadget.

In its early usage, IT found its way into school administration by replacing the pen and pad in ledger keeping. Attendance accounting and grade reporting applications were developed. Later IT replaced the pen, pad and felt board in solving the most complex of school technical problems - school scheduling. G. Ernest Anderson pioneered the programming of a fine school scheduling algorithm in the early 1960's (Grossman and Howe, 1965, pp. 198-209).

Extensions enable a culture to evolve, and to evolve rapidly. With the Anderson algorithm and a main frame computer, principals could improve their school's curriculum. Courses could be offered in semesters or quarters of a year. An English section could be linked to a History section in contiguous time blocks so teamed teachers could offer a two period Humanities course to the same group of students. Principals could balance course sections by gender or the ethnic origin of students. In short, the curriculum evolved

and better served students and teachers because of IT.

In this study, my purpose was to further explore the impact of current IT on the social structure of the school as an organization. By current IT I mean the speedy, powerful, at times networked, microcomputers of the 1990's, coupled with applications software available to principals. I wanted to go beyond the early IT (1960-1980's) developments that have been well documented and briefly mentioned earlier. I wanted to explore the consequences of IT for current principals who are au courant with its usage. There were three major extensions evident.

IT and The Principalship

In most schools in Quebec, the person responsible for IT is not the principal. Typically, a vice-principal or a technician has this job. One principal noted, "I delegate most (information processing) work to my secretary." Only a few principals see themselves as competent enough to champion IT in their school.

It seems that the principalship is viewed as a "person" job. The core of the principalship is not seen as technical work. As one principal put it, "Ninety per cent of my time is with people; the computer has a small impact on school administration." In fact, if a vice-principal becomes very

competent in IT - if his or her reputation in school is based in large measure in computing skills - then he or she is not as promotable as the generalist administrator. Knowledge can become a career-limiting factor.

This viewpoint goes further. The few principals who have developed some sophistication in IT run the risk of being accused by their peers and superiors of "not doing their job." One principal commented on his superiors, "They think I spend too much time on the machine, and not enough (time) doing my job! They can't see the utility of the information technology." Principals' evaluations were diminished. They become less promotable. One was even transferred to another school to be "given a message."

This paradoxical situation, learning in school being rejected by educators, seems most unusual. It may explain some of Visscher's (1988) findings in The Netherlands. There he found, as in Quebec, that schools have not progressed beyond the automation of old applications. As Small (1990) put it, "decorating the status quo." As long as this definition of the principalship persists, it seems likely that many principals will resist investigating the possible extensions that IT offers to extend and develop their school culture. Perhaps a more fundamental question needs to be asked. Why is using technology by principals

seemingly rejected?

It should be noted as well that since IT was introduced into the school office, secretaries have had problems learning the new technology. In particular, when a senior secretary had more difficulty than her junior counterpart in developing IT skills, the senior secretary's status in the office had been threatened. Status reversal resulting from IT has required a few senior secretaries to move to other less technical positions; it has required technician posts to be created in the school office.

It seems that technical advancement in the administration of schools could be dysfunctional to a principal's or a secretary's career.

IT and Students' Programs of Study

Back in the 1950's secondary school principals often spent their summers building a school master schedule, then loading students into courses and sections. They did this only once a year. In the 1960's, using a scheduling program running on a main frame computer, a principal could adjust a master schedule a number of times to minimize student course conflicts. Each scheduling "run" took minutes on the computer. In the 1980's, principals didn't even have to go to the main frame computer. They ran their scheduling

programs on a microcomputer in their own school.

Yet, in most schools old norms persisted into the 1980's. Students might try to change their schedules when school opened in September, but the administration was typically adamant. No changes! Students took the teachers they were assigned to. Public schools were not oriented to program adjustment or the choice of teachers.

Today in Quebec, a few principals have rejected these norms. They see IT as enabling them to meet with students and parents and custom design a student's program. Teachers and pupils can be matched, or parted, based upon student learning styles and individual preferences. Using a microcomputer, the principal can adjust a schedule in a few minutes. As well, students new to the school during the year can be scheduled right away.

IT has extended the student course programming process and produced new norms regarding teacher-student assignments. Principals believe it is correct to adjust student schedules; principals believe it is correct to match students with teachers. This has certainly led to better teaching and learning situations.

IT and Public Relations

In the metropolitan regions of Quebec, schools are in

competition with each other for students; the situation is exacerbated by a general decline in enrollment throughout the province. Public transportation enables students to reach the school of their choice. Principals want to maintain their school's enrollment for a number of reasons. If a school retains its staff, teacher moral remains high. A few principals see IT as a means of maintaining their staff and building a positive image of their school in the community.

Parents often contact the principal about their child - for a number of reasons. Principals with a microcomputer at hand can quickly call up a student's demographic file, report card file, attendance record, schedule, or disciplinary file. They can be immediately knowledgeable about the student. They can present an "informed face" to parents. They can serve the parents. They can build the parents' confidence in the school. They can maintain enrollments.

Also, principals can track student performance in school. They can generate reports about student absences from school, about marked shifts in student performance in class, about student achievement at school, and then produce personalized letters to the students or parents. This provides service to parents and students. This, too, adds to the image of the school in the community. Principals who are

technically au courant see IT as a public relations device.

IT and Teachers

By and large, principals did not see teachers getting involved in the administrative applications of IT. Teachers did use the automated grade reporting and attendance packages available to them; teachers used IT to replace former pen and paper ledger applications.

CONCLUSION

The impact of IT on secondary schools in Quebec is limited by a few factors. The role of the secondary principal is defined as a "person-oriented" position. Neither rewards nor promotions are given to principals who are technically inclined (Techies).

It seems that principals define their role as that of a public servant. They are not crusaders. They are not warriors. They don't have any fire in their belly. They are here to serve and support. They are reluctant to challenge and change. Mechlenburger stated, "The root issue for educators is how to blend ... (the) tradition of schooling with the capabilities of ... information and communications technologies." The few principals that meet this challenge are a threat to their peers; they are eased

aside.

Of course, this finding may have been true whether the issue was technological innovation or a new means of staff evaluation (Guthrie and Willower, 1973); whether the concern was curriculum innovation or school restructuring. It seems the majority of secondary schools principals in Quebec, and possibly elsewhere, are more concerned with maintaining the status quo, and serving their staffs and students in a supportive, reactive, "as required" fashion, than in bringing about educational development. This is not a new viewpoint, but one that does not seem to hold favor in the popular literature on school administration.

Teachers are not concerned with the administrative uses of technology. If technology helps them keep ledgers, fine.

A few principals are able to extend their schools and schooling - to improve the lot of students and teachers through creative scheduling methods, through changing school norms related to student scheduling, and through using IT as a public relations tool. But they have had limited success in extending technological advances to colleagues. Merriman (1986, p. 171) noted, "The need to build community support, as well as support among school district personnel, is great ... teachers of administrators (need to) view technology in a positive sense." The social pressures to keep the

principalship a "person" occupation are too strong to permit technological adaptation to improve the lot of some secondary schools.

The Visscher model seems to focus on the functional aspects of IT on schooling. Some recent research overlooks the constraints placed on the role of the principal in developing IT (Willard, 1988). There is clear need to detail the social forces at work that limit growth in schools and to help us improve our understanding about the process of change.

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